From: Rauscher, Jon
Sent: Friday, September 1, 2017 10:00 AM
To: Martin, John; Zehner, Warren; Brescia, Nicolas; Bernier, Roberto
Cc: Spurlin, Steve; R6HarveyENVL
Subject: M6H1 Hurricane Harvey - QASP Addendum for Arkema
Attachments: 8260_Analyte_List.xlsx; 8270_Analyte_List.xlsx; Hurricane Harvey Water QASP Addendum.docx

I have attached a draft QASP for water sampling at Arkema facility.

The Region 6 EU is coordinating with Roberto Bernier concerning the number and locations of the water samples.

From: Brown, Michelle [mailto:Michelle.Brown@WestonSolutions.com]
Sent: Friday, September 01, 2017 9:42 AM
To: Rauscher, Jon
Cc: R6HarveyInfo ; R6HarveyENVL
Subject: Harvey QASP Addendum for Arkema

Hi Jon – here is the first rough draft I have developed for the Water QASP Addendum for Arkema. In addition, I have included the 8260 and 8270 list we will be submitting to the labs. This list was established using the CLP SOM List. Please approve the attached list of compounds to ensure we are requesting the analytes required. I will further modify this addendum once additional information is received concerning the Naphtha analyses methodology and collection requirements. Thank you - Michelle

Please note our new office address below.

Michelle Brown, CHMM
Weston Solutions, Inc.
2600 Dallas Parkway, Suite 280
Frisco, Texas 75034
Direct: 469-666-5527
Cell: 972-977-2644
Michelle.Brown@westonsolutions.com

Analyte	CAS Number	Units
1,1,1-Trichloroethane	71-55-6	ug/L
1,1,2,2-Tetrachloroethane	79-34-5	ug/L
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ug/L
1,1,2-Trichloroethane	79-00-5	ug/L
1,1-Dichloroethane	75-34-3	ug/L
1,1-Dichloroethene	75-35-4	ug/L
1,2,3-Trichlorobenzene	87-61-6	ug/L
1,2,4-Trichlorobenzene	120-82-1	ug/L
1,2-Dibromo-3-chloropropane	96-12-8	ug/L
1,2-Dibromoethane	106-93-4	ug/L
1,2-Dichlorobenzene	95-50-1	ug/L
1,2-Dichloroethane	107-06-2	ug/L
1,2-Dichloropropane	78-87-5	ug/L
1,3-Dichlorobenzene	541-73-1	ug/L
1,4-Dichlorobenzene	106-46-7	ug/L
2-Butanone	78-93-3	ug/L
2-Hexanone	591-78-6	ug/L
4-Methyl-2-pentanone	108-10-1	ug/L
Acetone	67-64-1	ug/L
Benzene	71-43-2	ug/L
Bromochloromethane	74-97-5	ug/L
Bromodichloromethane	75-27-4	ug/L
Bromoform	75-25-2	ug/L
Bromomethane	74-83-9	ug/L
Carbon disulfide	75-15-0	ug/L
Carbon tetrachloride	56-23-5	ug/L
Chlorobenzene	108-90-7	ug/L
Chloroethane	75-00-3	ug/L
Chloroform	67-66-3	ug/L
Chloromethane	74-87-3	ug/L
cis-1,2-Dichloroethene	156-59-2	ug/L
cis-1,3-Dichloropropene	10061-01-5	ug/L
Cyclohexane	110-82-7	ug/L
Dibromochloromethane	124-48-1	ug/L
Dichlorodifluoromethane	75-71-8	ug/L
Ethylbenzene	100-41-4	ug/L
Isopropylbenzene	98-82-8	ug/L
m,p-Xylene	179601-23-1	ug/L
Methyl Acetate	79-20-9	ug/L
Methyl tert-butyl ether	1634-04-4	ug/L
Methylcyclohexane	108-87-2	ug/L
Methylene chloride	75-09-2	ug/L
o-Xylene	95-47-6	ug/L
Styrene	100-42-5	ug/L
Tetrachloroethene	127-18-4	ug/L
Toluene	108-88-3	ug/L
trans-1,2-Dichloroethene	156-60-5	ug/L
trans-1,3-Dichloropropene	10061-02-6	ug/L
Trichloroethene	79-01-6	ug/L
Trichlorofluoromethane	75-69-4	ug/L
Vinyl chloride	75-01-4	ug/L
Xylene (total)	1330-20-7	ug/L

Notes:
a - EPA 2016 Removal Management (May 2016);

Analyte	CAS Number	Units
1,1'-Biphenyl	92-52-4	ug/L
1,2,4,5-Tetrachlorobenzene	95-94-3	ug/L
1,4-Dioxane	123-91-1	ug/L
2,2'-Oxybis(1-chloropropane)	108-60-1	ug/L
2,3,4,6-Tetrachlorophenol	58-90-2	ug/L
2,4,5-Trichlorophenol	95-95-4	ug/L
2,4,6-Trichlorophenol	88-06-2	ug/L
2,4-Dichlorophenol	120-83-2	ug/L
2,4-Dimethylphenol	105-67-9	ug/L
2,4-Dinitrophenol	51-28-5	ug/L
2,4-Dinitrotoluene	121-14-2	ug/L
2,6-Dinitrotoluene	606-20-2	ug/L
2-Chloronaphthalene	91-58-7	ug/L
2-Chlorophenol	95-57-8	ug/L
2-Methylnaphthalene*	91-57-6	ug/L
2-Methylphenol	95-48-7	ug/L
3-Methylphenol	108-39-4	
2-Nitroaniline	88-74-4	ug/L
2-Nitrophenol	88-75-5	ug/L
3,3'-Dichlorobenzidine	91-94-1	ug/L
3-Nitroaniline	99-09-2	ug/L
4,6-Dinitro-2-methylphenol	534-52-1	ug/L
4-Bromophenyl-phenylether	101-55-3	ug/L
4-Chloro-3-methylphenol	59-50-7	ug/L
4-Chloroaniline	106-47-8	ug/L
4-Chlorophenyl-phenylether	7005-72-3	ug/L
4 Methylphenol	106-44-5	ug/L
4-Nitroaniline	100-01-6	ug/L
4-Nitrophenol	100-02-7	ug/L
Acenaphthene*	83-32-9	ug/L
Acenaphthylene*	208-96-8	ug/L
Acetophenone	98-86-2	ug/L
Anthracene*	120-12-7	ug/L
Atrazine	1912-24-9	ug/L
Benzaldehyde	100-52-7	ug/L
Benzo(a)anthracene*	56-55-3	ug/L
Benzo(a)pyrene*	50-32-8	ug/L
Benzo(b)fluoranthene*	205-99-2	ug/L
Benzo(g,h,i)perylene*	191-24-2	ug/L
Benzo(k)fluoranthene*	207-08-9	ug/L
Bis(2-chloroethoxy)methane	111-91-1	ug/L
Bis(2-chloroethyl)ether	111-44-4	ug/L
Bis(2-ethylhexyl)phthalate	117-81-7	ug/L
Butylbenzylphthalate	85-68-7	ug/L
Caprolactam	105-60-2	ug/L
Carbazole	86-74-8	ug/L
Chrysene*	218-01-9	ug/L
Dibenzo(a,h)anthracene*	53-70-3	ug/L
Dibenzofuran	132-64-9	ug/L
Diethylphthalate	84-66-2	ug/L

Dimethylphthalate	131-11-3	ug/L
Di-n-butylphthalate	84-74-2	ug/L
Di-n-octylphthalate	117-84-0	ug/L
Fluoranthene*	206-44-0	ug/L
Fluorene*	86-73-7	ug/L
Hexachlorobenzene	118-74-1	ug/L
Hexachlorobutadiene	87-68-3	ug/L
Hexachlorocyclopentadiene	77-47-4	ug/L
Hexachloroethane	67-72-1	ug/L
Indeno(1,2,3-cd)pyrene*	193-39-5	ug/L
Isophorone	78-59-1	ug/L
Naphthalene*	91-20-3	ug/L
Nitrobenzene	98-95-3	ug/L
N-Nitroso-di-n-propylamine	621-64-7	ug/L
N-Nitrosodiphenylamine	86-30-6	ug/L
Pentachlorophenol	87-86-5	ug/L
Phenanthrene*	85-01-8	ug/L
Phenol	108-95-2	ug/L
Pyrene*	129-00-0	ug/L

Notes:
a - EPA 2016 Removal Management (May 2016);
* These parameters can be reported with the SIM analysis.

QUALITY ASSURANCE SAMPLING PLAN ADDENDUM

FOR

ARKEMA
WATER SAMPLING
HURRICANE HARVEY RESPONSE SUPPORT
IMPACTED AREAS ALONG THE TEXAS AND LOUISIANA GULF COAST

Prepared for

U.S. Environmental Protection Agency Region 6
Will LaBombard, Project Officer
1445 Ross Avenue
Dallas, Texas 75202

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WESTON Work Order No. TBD
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SSID: TBD
EPA OSC TBD
START-4 PTL TBD

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August 2017

SIGNATURE PAGE

TBD U.S. EPA Region 6 On-Scene Coordinator	Date
David Crow Weston Solutions, Inc. START-4 Readiness Coordinator	Date
Jeff Wright Weston Solutions, Inc. START-4 Quality Assurance Officer	Date
TBD Weston Solutions, Inc. START-4 Project Team Leader	Date

TABLE OF CONTENTS

APPENDICES

TABLES

1. INTRODUCTION

START-4 has prepared this Quality Assurance Sampling Plan (QASP) Addendum to describe the technical scope of work at the Arkema Facility spill in conjunction with the Hurricane Harvey Response. This Addendum only addresses the additional elements pertaining to the Arkema sampling event, and is to be used with the original Water Sampling QASP.

2. SITE BACKGROUND, LOCATION, AND DESCRIPTION

At approximately 2 a.m. CDT, on 31 August 2017, the Harris County Emergency Operations Center (EOC) was notified of two explosions and black smoke coming from the Arkema Inc. plant in Crosby, Texas. Local officials had previously established an evacuation zone in an area 1.5 miles from the plant, based on their assessment of the situation. The objective of the sampling is to obtain data in relation to the Arkema chemical explosion and spill. The Arkema plant produces liquid organic peroxides (in a product called Luperox®) that are primarily used in the production of plastic resins, polystyrene, polyethylene, polypropylene, PVC and polyester reinforced fiberglass, and acrylic resins. The chemicals associated with this product include the following:

TABLE 2-1
Chemicals of Concern (COCs)

Analyte	CAS#
Neodecaneperoxoic acid, 1,1- dimethylpropyl ester	68299-16-1
Naphtha (petroleum), heavy alkylate	64741-65-7
Naphtha (petroleum), hydrotreated heavy	64742-48-9
Hydroperoxide, 1,1-dimethylpropyl	3425-61-4
Peroxydicarbonic acid, dipropyl ester	16066-38-9
Neodecaneperoxoic acid, 1-methyl-1- phenylethyl ester	26748-47-0
Propaneperoxoic acid, 2,2-dimethylehtyl ester, 1,1-dimethylethyl ester	927-07-1
Peroxide, bis(1,1-dimethylpropyl)	10508-09-5

These chemicals are specialty chemicals that commercial labs are unable to analyze for and no risk levels have been established. General volatile (VOCs) and semivolatile (SVOCs) analysis will be conducted and the results of these analyses will be assessed against the Regional Removal

Management Levels for Chemicals (RMLs) at the HQ>3 or risk level of 10-4 or greater to determine unacceptable risk (https://www.epa.gov/risk/regional-removal-management-levels-chemicals-rmls). If either of these risk levels are exceeded the facility will be moved to a site specific investigation for the evaluation and mitigation of the associated risks. In addition a, specialty analysis for the prescience or absence of Naphtha will be conducted. This analysis is not an EPA approved method, and will be used only for the determination of chemical presence, not risk.

It is important to note that the absence of hazardous compounds or analytes does not indicate that contact with or ingestion of this water is in anyway safe. In a flood situation there are multiple risk factors that can cause adverse responses, industrial chemicals are only one of those risk factors. The Centers for Disease Control and Prevention (CDC), in conjunction with the Agency for Toxic Substances and Disease Registry (ATSDR) and the Texas Department of State Health Services (TDSHS), has recommended that flood water be avoided to the extent practical and has suggested procedures if you do have to contact flood waters (https://www.cdc.gov/healthywater/emergency/extreme-weather/floods-standingwater.html).
The flood waters are contaminated with household chemicals, oil and gas from submerged vehicles and from the sewer systems and septic tanks have been inundated. EPA cannot evaluate all the potential factors and variables to make a determination that the flood waters are safe. It is for this reason that EPA will not make a determination on the safety of floodwaters. That determination, if it is made, will be made by the Texas Department of State Health Services.

2.1 SITE CONCERNS

The primary concern for the Arkema plant spill is to determine the presence of contamination from the facility resulting from the explosions and subsequent spill and determine if an unacceptable risk to human health and the environment exists.

3. SAMPLING APPROACH AND PROCEDURES

Samples collected by START-4 will be used to evaluate the nature of the contaminants present. In the field, in order to help determine the presence of chemicals within the floodwaters at the facility, a pH reading will be collected using pH strips and results logged in the field notes.

3.1 SAMPLE PRESERVATION, CONTAINERS, AND HOLD TIMES

Once collected, samples will be stored on ice at 4 degrees Celsius, in the dark, in coolers while at the site and until submitted for laboratory analysis. The samples will be sent by common carrier to the laboratory or driven by the WESTON START-4 members.

WESTON will receive analytical results based on discussions with the EPA OSC. This turnaround time is initiated when the samples are collected in the field and continues until the analytical results are made available to WESTON either verbally or by providing facsimile or email copies of the results for review. Samples that have been analyzed will be disposed by the designated laboratory in accordance with the laboratory SOPs.

4. ANALYTICAL APPROACH

Samples collected by START-4 during the sampling task will be delivered to EPA-designated laboratories for VOCs, and SVOCs, utilizing EPA publication SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*. In addition, a specialized analysis for Naptha will be conducted. In determining the potential for unacceptable risk, analytical results will be compared to Regional Removal Management Levels for Chemicals (RMLs) in addition to site-specific background levels determined by the Environmental Unit. Additionally, the analytical results will be compared to site-specific background concentrations (to determine areas of observed contamination). RMLs are provided in Appendix C. Table 4-1 provides requirements for containers, preservation techniques, sample volumes, and holding times

TABLE 4-1

REQUIREMENTS FOR CONTAINERS, PRESERVATION TECHNIQUES, SAMPLE VOLUMES, AND HOLDING TIMES

Name	Analytical Methods	Container	Preservation	Minimum Sample Volume or Weight	Maximum Holding Time
VOCs	SW8260B	G, amber, (Teflon lined septum for water; 40 ml Teflon lined)	4°C, HCl to pH<2 (pH adjust for water only)	3 x 40 mL vials (for water)	14 days (7 days if unpreserved by acid) for water
SVOCs	SW8270C	G, Teflon lined cap	4°C	1 liter	7 days extract/40 days analysis (water)
Naptha					